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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NITZAN PELEG and YUVAL SHERMAN

Appeal 2009-004053
Application 10/813,843[1]
Technology Center 2100

Decided: January 5, 2010

Before LEE E. BARRETT, JAY P. LUCAS, and JAMES R. HUGHES, *Administrative Patent Judges.*

HUGHES, *Administrative Patent Judge.*

DECISION ON APPEAL

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[1] Application filed March 31, 2004. The real party in interest is Hewlett-Packard Development Company, LP. (Br. 2.)

STATEMENT OF THE CASE

The Appellants appeal the Examiner's rejection of claims 1-22 under authority of 35 U.S.C. § 134(a). The Board of Patent Appeals and Interferences (BPAI) has jurisdiction under 35 U.S.C. § 6(b).

We affirm.

Appellants' Invention

The Appellants invented a database management system and method for performing refresh operations on a materialized view utilizing a base table, the materialized view, and a refresh log. (Abstract; Spec. 8, ¶ [0022]; 9, ¶ [0024].)[2]

Claims

Independent claims 1 and 6 further illustrate the invention. They read as follows:

> 1. A system for performing refresh operations, the system comprising:
>
> a base table having a first plurality of data entries;
>
> a first materialized view that comprises a second plurality of data entries, the second plurality of data entries being associated with the first plurality of data entries in the base table;
>
> a refresh log that contains a plurality of changes in the base table; and

[2] We refer to Appellants' Specification ("Spec.") and Appeal Brief ("Br.") filed August 27, 2007. We also refer to the Examiner's Answer ("Ans.") mailed December 31, 2007.

a module adapted to perform a refresh operation on the first materialized view using the second plurality of data entries, the module configured to;

access the refresh log and the first materialized view;

calculate a plurality of delta values from the plurality of changes in the refresh log and the second plurality of data entries in the first materialized view;

apply the plurality of delta values to the second plurality of data entries in the first materialized view; and

provide the plurality of delta values to a delta adaptation module for updating a second materialized view.

6. A system for performing a pipelined refresh, the system comprising:

a first materialized view derived at least partially from a base table;

a refresh log having a plurality of entries, each of the plurality of entries corresponding to a change in the base table,

a second materialized view derived at least partially from the first materialized view;

a refresh module that comprises;

a first delta calculation module that calculates a plurality of delta values that represents the changes to the first materialized view;

a first delta processing module that applies the plurality of delta values to the first materialized view;

a delta adaptation module that receives the plurality of delta values from the first delta calculation module and calculates a plurality of changes to the second materialized view;

a second delta calculation module that obtains the plurality of changes to the second materialized view from the delta adaptation module; and

a second delta processing module that applies the plurality of changes to the second materialized view from the second delta calculation module to the second materialized view.

References

The Examiner relies on the following references as evidence of unpatentability:

Sun	US 5,963,959	Oct. 5, 1999
Gupta	US 7,111,020 B1	Sept. 19, 2006

Rejections

The Examiner rejects claims 1, 3, 5, 11-17, and 20 under 35 U.S.C. § 102(b) as anticipated by Sun.[3]

The Examiner rejects claims 2, 4, 6-10, 18, 19, 21, and 22 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Sun and Gupta.

[3] We note that the Examiner rejects dependent claim 2 in view of the Sun and Gupta references and dependent claim 3 in view of only the Sun reference. Claim 3 depends on claim 2. Thus, it appears that the Examiner erred in grouping the rejected claims. Appellants do not object to the rejection of claim 3 as improper, and we interpret the Examiner's rejection as rejecting claim 3 under 35 U.S.C. § 103(a) over each of the references cited with respect to claim 2. Accordingly, we view the Examiner's mistake as harmless error.

Claim Groupings

Based on Appellants' arguments in the Brief, we find the following claim groupings. Appellants argue the limitations of independent claim 1 and mention independent claims 11, 12, and 20 with respect to the § 102(b) rejection, but provide no additional arguments with respect to independent claims 11, 12, and 20 or dependent claims 3 (*see* note 3 *supra*), 5, and 13-17. (Br. 8-17.) Appellants also argue the limitations of independent claim 6 with respect to the § 103(a) rejection, but provide no additional arguments with respect to dependent claims 2, 3 (*see* note 3 *supra*), 4, 7-10, 18, 19, 21, and 22. (Br. 17-22.) Accordingly, we find Appellants do not separately argue claims 2-5 and 7-22. Therefore, Appellants waive separate argument of independent claims 11, 12, and 20. Dependent claims 2-5, 13-19, 21, and 22 stand or fall with independent claim 1. Dependent claims 7-10 stand or fall with independent claim 6. We address only claims 1 and 6, *infra*. We address only those arguments that Appellants present in the Brief. Arguments that Appellants could have made but chose not to make in the Brief are waived. *See* 37 C.F.R. § 41.37(c)(1)(vii) ("Notwithstanding any other provision of this paragraph, the failure of appellant to separately argue claims which appellant has grouped together shall constitute a waiver of any argument that the Board must consider the patentability of any grouped claim separately.").

ISSUES

Based on Appellants' contentions, as well as the findings and conclusions of the Examiner, the pivotal issues before us for review are as follows.

1. Do Appellants establish that the Examiner erred in finding the Sun reference discloses: (1) a module configured to access a refresh log and a first materialized view; (2) a module adapted refresh a first materialized view using a second plurality of data entries; (3) a module calculating a plurality of delta values from a plurality of changes in a refresh log and a second plurality of data values in a first materialized view; and (4) a module configured to apply a plurality of delta values to a second plurality of data entries in a first materialized view?

2. Do Appellants establish that the Examiner erred in finding the Sun and Gupta references collectively teach or would have suggested: (1) a first delta processing module that applies a plurality of delta values to a first materialized view; and (2) a first delta calculation module, a second delta calculation module, and a second processing delta module?

FINDINGS OF FACT (FF)

Sun Reference

1. Sun describes a system and method for performing a fast refresh on a snapshot view of a database. The database includes a master table with data values that may be displayed in a master view as well as a snapshot view. Sun detects modifications to the master table and records primary key values in a master log – the primary key values represent primary keys stored in each row of the master table. During the refresh Sun's system reconciles the snapshot and the master table/master view utilizing the primary key values associated with the master table and stored

in the master log. (Abstract; col. 1, ll. 9-15; col. 4, l. 28 to col. 6, l. 66; Figs. 2(a)-2(e), 3, 4(a)-4(e).)

2. Sun's snapshot is a materialized view of a body of data constructed from the master table. (Col. 1, ll. 9-15, col. 4, l. 66 to col. 5, l. 2.)

3. Sun describes the "operation of a fast refresh mechanism" (col. 5, ll. 10-11), i.e., computer programming operable to perform refresh functions. For example, Sun describes utilizing SQL statements to update (refresh) the snapshot with revised data values from the master table/master view. (Col. 4, l. 28 to col. 6, l. 66; Figs. 2(a)-2(e), 3, 4(a)-4(e).)

Gupta Reference

4. Gupta describes base tables (Fig. 1A), materialized views (Fig. 1B), as well as refresh logs and views (Figs. 4B-1, 4B-2, 4C-1, & 4C-2).

5. Gupta describes a materialized view divided into multiple partitioned sections that may be separately updated. (Col. 6, ll. 35-59; Fig. 1B, partitions 142 & 144.) Similarly, Gupta describes multiple materialized views that may be separately updated, as well as multiple refresh logs and views. (Col. 9, ll. 27 to col. 11, l. 2; col. 15, l. 40 to col. 16, l. 43; Figs. 4A, 4B-1, 4B-2, 4C-1, & 4C-2.) Gupta describes a refresh mechanism for updating (refreshing) the materialized view(s) based on the refresh logs, and describes specific steps and corresponding SQL commands for the refresh operations. (Col. 7, l. 65 to col. 13, l. 9; col. 15, l. 40 to col. 16, l. 43; Figs. 3A-3D & 5A-5E.)

PRINCIPLES OF LAW

Burden on Appeal

Appellant has the burden on appeal to the Board to demonstrate error in the Examiner's position. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006) ("On appeal to the Board, an applicant can overcome a rejection by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness.") (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998)).

Anticipation

Anticipation is a question of fact. *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997). Under 35 U.S.C. § 102, "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 631 (Fed. Cir. 1987) (citations omitted); *see also Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1375 (Fed. Cir. 2005)(citation omitted).

Obviousness

A claimed invention is not patentable if the subject matter of the claimed invention would have been obvious to a person having ordinary skill in the art. 35 U.S.C. § 103(a); *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007); *Graham v. John Deere Co.*, 383 U.S. 1, 13 (1966). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level

of skill in the art. *Graham*, 383 U.S. at 17. *See also KSR*, 550 U.S. at 407 ("While the sequence of these questions might be reordered in any particular case, the [Graham] factors continue to define the inquiry that controls.")

In *KSR*, the Supreme Court emphasizes "the need for caution in granting a patent based on the combination of elements found in the prior art," and stated that "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR*, 550 U.S. at 415-16. The Court explained:

> When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

Id. at 417. The operative question is thus "whether the improvement is more than the predictable use of prior art elements according to their established functions." *Id.*

ANALYSIS

Issue 1: Rejection of claims 1, 3, 5, 11-17, and 20 under 35 U.S.C. § 102(b)

Sun describes a system that performs a fast refresh on a database snapshot view. The snapshot is a viewable (materialized view) data construct utilizing data from a database master table. The master table data may also be viewed in a master view. Sun's system detects modifications to the master table and stores related data values (primary key values) in a

master log for the rows of the master table that change. Sun describes a "fast refresh mechanism" that includes programming operable to perform refresh functions on the snapshot. During the refresh of the snapshot Sun's system reconciles the snapshot and the master table/master view utilizing SQL statements that in turn utilize the primary key values associated with the master table and stored in the master log. (FF 1-3.) Thus, we find that an ordinarily-skilled artisan would have understood Sun to describe a system for performing refresh operations, the system including: a master table containing data values; a snapshot (materialized) view constructed from data in the master table; a master log containing primary key values associated with changes to the master table; and programming for refreshing (updating) the snapshot.

The Examiner finds that the prior art discloses and/or teaches each feature of Appellants' claims (Ans. 3-12), and maintains that each of the claims is properly rejected (Ans. 13-17).

Appellants, however, present a number of arguments generally asserting that the Sun reference does not disclose each of the claimed features of claim 1. We address each argument in the order presented by Appellants, *infra*.

We note at the outset, as a general proposition, merely reciting that data corresponds to a particular type of data, e.g., a "first plurality of data entries" or a "second plurality of data entries," as opposed to some other unique identifier, essentially constitutes non-functional descriptive material as it does not further limit the claimed invention either functionally or structurally. Similarly, reciting that a "log," "view," or "module" corresponds to a particular type or function, e.g., a "delta adaptation

module," as opposed to some other unique identifier, does not further limit the claimed invention either functionally or structurally. Such non-functional descriptive material does not patentably distinguish claims over the prior art that otherwise renders the claims unpatentable. *In re Ngai*, 367 F.3d 1336, 1339 (Fed. Cir. 2004).[4]

We determine the scope of the claims in patent applications not solely based on the claim language, but upon giving claims "their broadest reasonable interpretation consistent with the [S]pecification" and "in light of the [S]pecification as it would be interpreted by one of ordinary skill in the art." *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004) (citations omitted).

We have carefully reviewed claim 1 and interpreted its scope in view of current legal guidance. (*See In re Ngai*, 367 F.3d at 1338.) With regard to the limitations actually recited in representative claim 1, the labeling of certain features, as discussed *supra*, is a non-functional distinction – specifically, a "base" table, a "refresh" log, "delta" values, and a "delta adaptation" module – as these "names" do not functionally distinguish the claim elements. Thus, when confronted with a reference that otherwise provides the claimed features – a data table, a data log containing data associated with data table modifications, data associated with data table modifications (i.e., changes, differences, or deltas), or computer

[4] *See also Ex parte Nehls*, 88 USPQ2d 1883, 1887-89 (BPAI 2008) (precedential) (discussing cases pertaining to non-functional descriptive material); *Ex parte Mathias*, 84 USPQ2d 1276 (BPAI 2005), *aff'd* by *In re Mathias*, 191 Fed. Appx. 959 (Fed. Cir. 2006) (Rule 36, unpublished); *Ex parte Curry*, 84 USPQ2d 1272 (BPAI 2005) (informative), *aff'd by In re Curry*, No. 2006-1003 (Fed. Cir. 2006) (Rule 36, unpublished) (both cases treating data as nonfunctional descriptive material).

programming manipulating data to perform a particular function (e.g., updating a view (delta adaptation)) – in the manner claimed, but chooses to label them differently, we cannot give significant patentable weight to such labels.

a. Argument That Sun Doesn't Disclose a Module Configured To Access a Refresh Log and a First Materialized View

We first address Appellants' contention that the Examiner improperly rejected claim 1 as anticipated by Sun because the Sun reference doesn't disclose a "module configured to access the refresh log and the first materialized view." (Br. 14.)

The Examiner finds that Sun discloses refresh operations accessing the master log and the snapshot. (Ans. 4, 13.) Accordingly, we decide the question of whether the Sun reference discloses a module configured to access the refresh log and the first materialized view.

After reviewing the record on appeal, we find the Sun reference discloses the disputed limitation. We interpret, broadly but reasonably (*see Am. Acad. of Sci. Tech Ctr.*, 367 F.3d at 1364, *supra*) the terminology of the disputed limitation. Appellants' "refresh" log is a data construct storing database change data. Appellants' "first materialized" view is a viewable data construct including a set of data. And, Appellants' "module" is computer program manipulating data to perform a particular function. Thus, we agree with the Examiner's findings that Appellants' refresh log and first materialized view read on Sun's master log and snapshot. (FF 1; Ans. 3-4.) We also find that Sun discloses a computer program that accesses the master log and snapshot. (FF 1-3.) We are not persuaded by Appellants' contrary arguments that Sun does not disclose the disputed features, especially in

view of Appellants' misconstruction of the Examiner's basis for the rejection – that the Examiner "incorrectly equates Sun's master table for Appellants' claimed *refresh log*" (Br. 14).

Appellants did not file a Reply Brief, nor did Appellants provide any persuasive evidence supporting the assertions of alleged error in the Examiner's position. Accordingly, Appellants have not met the burden to show error in the Examiner's findings.

b. Argument That Sun Doesn't Disclose a Module Adapted To Perform a Refresh Operation On The First Materialized View Using The Second Plurality Of Data Entries

We next address Appellants' contention that the Examiner improperly rejected claim 1 as anticipated by Sun because the Sun reference doesn't disclose "a module adapted to perform a refresh operation on the first materialized view using the second plurality of data entries." (Br. 15.)

The Examiner finds that Sun discloses refresh operations on the snapshot. (Ans. 4, 13-14.) Accordingly, we decide the question of whether the Sun reference discloses a module adapted to perform a refresh operation on the first materialized view using the second plurality of data entries.

After reviewing the record on appeal, we find the Sun reference discloses the disputed limitation. Appellants' "second plurality of data entries" is non-functional descriptive material (*see* discussion *supra*). Appellants do not explicitly define the "second plurality of data entries" in their Specification or in the claim. Nor, does the language of Appellants' claim 1 preclude the "first" and "second" data entries from being identical, or otherwise distinguish the data sets from one another. Therefore, we broadly but reasonably interpret Appellants' "second plurality of data entries" as merely a second data set. We agree with the Examiner's findings

and we also find that Sun discloses computer programming to refresh/update the snapshot – i.e., a first materialized view (*see* discussion *supra*). The data making up the snapshot – i.e., the second plurality of data entries – is merely a (second) set of data from the master table. Sun's refresh mechanism utilizes this data to refresh the snapshot. (FF 1 & 3.) We are not persuaded by Appellants' contrary arguments that Sun does not disclose the disputed features because Appellants, as pointed out by the Examiner (Ans. 14), do not explain how or why the Examiner's findings are in error.

Appellants did not file a Reply Brief, nor did Appellants provide any persuasive evidence supporting the assertions of alleged error in the Examiner's position. Accordingly, Appellants have not met the burden to show error in the Examiner's findings.

c. Argument That Sun Doesn't Disclose a Module For Calculating Delta Values From a Plurality Of Changes In A Refresh Log and a Second Plurality Of Data Values In a First Materialized View

We next address Appellants' contention that the Examiner improperly rejected claim 1 as anticipated by Sun because the Sun reference doesn't disclose "calculating [a plurality of] delta values from a plurality of changes in a refresh log and a second plurality of data values in a first materialized view." (Br. 15-16.)

The Examiner finds that Sun discloses calculating change values or differences from the master log and the snapshot. (Ans. 4, 14-15.) Accordingly, we decide the question of whether the Sun reference discloses calculating delta values from changes in a refresh log and a second plurality of data values in a first materialized view.

After reviewing the record on appeal, we find the Sun reference discloses the disputed limitation. As we explained *supra*, Sun discloses

computer programming that stores database changes in a master (refresh) log, and that refreshes/updates the snapshot utilizing data making up the snapshot from the master table. Appellants, as pointed out by the Examiner, do not explicitly define the "delta values" in their Specification or in the claim, and we find (supra) that this terminology is non-functional descriptive material. Therefore, we broadly but reasonably interpret Appellants' "delta values" as merely data associated with database (data table, base table, or master table) modifications, changes, or differences – i.e., deltas. We agree with the Examiner's findings and we also find that Sun discloses determining or calculating change data (values) from data in the master (refresh) log and the snapshot. (FF 1 & 3.)

Appellants did not file a Reply Brief, nor did Appellants provide any persuasive evidence supporting the assertions of alleged error in the Examiner's position. Accordingly, Appellants have not met the burden to show error in the Examiner's findings.

d. Argument That Sun Doesn't Disclose a Module Configured To Apply a Plurality Of Delta Values To a Second Plurality Of Data Entries In a First Materialized View

Lastly, we address Appellants' contention that the Examiner improperly rejected claim 1 as anticipated by Sun because the Sun reference doesn't disclose "a module configured to apply a plurality of delta values to the second plurality of data entries in a first materialized view." (Br. 17.)

The Examiner finds that Sun discloses applying delta values (differences in the database) to the snapshot. (Ans. 4, 15.) Accordingly, we decide the question of whether the Sun reference discloses a module configured to apply a plurality of delta values to a second plurality of data entries in a first materialized view.

After reviewing the record on appeal, we find the Sun reference discloses the disputed limitation. As we explained *supra*, Sun discloses computer programming that determines differences in database data, and refreshes/updates the snapshot utilizing this data and data making up the snapshot from the master table. Appellants do not explicitly define the term "apply," or explain how the "delta values" are applied to the data of the "first materialized view," either in their Specification or in the claim. We understand the term "apply" in this context to mean "to join with." Therefore, we broadly but reasonably interpret "a module configured to apply a plurality of delta values to a second plurality of data entries in a first materialized view" as computer programming to join the change data (data associated with database changes or differences) with the data of the materialized view. We agree with the Examiner's findings and we also find that Sun discloses joining change data with the data of the snapshot. (FF 1 & 3.)

Appellants did not file a Reply Brief, nor did Appellants provide any persuasive evidence supporting the assertions of alleged error in the Examiner's position. Accordingly, Appellants have not met the burden to show error in the Examiner's findings.

For all the foregoing reasons, Appellants have not persuaded us of error in the Examiner's anticipation rejection claims 1, 3, 5, 11-17, and 20. Accordingly, we affirm the Examiner's rejection of these claims.

Issue 2: Rejection of Claims 2, 4, 6-10, 18, 19, 21, and 22 under 35 U.S.C. § 103(a)

Appellants also contend that the Examiner improperly rejected claim 6 as obvious in view of the combination of the Sun and Gupta references

because the references collectively do not teach: (1) "a first delta calculation module that calculates a plurality of delta values that represents the changes to the first materialized view (Br. 21); (2) "a first delta processing module that applies the plurality of delta values to the first materialized view" (Br. 21); and (3) "a second delta calculation module or a second processing delta [sic] module" (Br. 22).

The Examiner finds that Sun and or Gupta each of these features. (Ans. 4, 10, 13-17.) Accordingly, we decide the question of whether the Sun and Gupta references collectively teach a first delta calculation module, a first delta processing module, a second delta calculation module, and a second delta processing module as claimed in claim 6.

As with claim 1 *supra*, we find that Appellants' first delta calculation module, first delta processing module, second delta calculation module, and second delta processing module are non-functional descriptive material, as these "modules" do not distinguish over prior art references that teach performing the same functions.

After reviewing the record on appeal, we find the Sun and Gupta references collectively teach a first delta calculation module, a first delta processing module, a second delta calculation module, and a second delta processing module as claimed in claim 6. As we explained with respect to claim 1 *supra*, Sun teaches computer programming that determines change values that represent modifications to the data in the snapshot – i.e., a first delta calculation module that calculates a plurality of delta values that represents the changes to the first materialized view. Also, as we explained with respect to claim 1 *supra*, Sun teaches computer programming that joins the change values to the data of the snapshot – i.e., a first delta processing

module that applies the plurality of delta values to the first materialized view.

We agree with the Examiner's findings (Ans. 10) and we also find that Gupta teaches: (1) computer programming that calculates change values that represent modifications to the data in a second materialized view – i.e., a delta adaptation module that receives the plurality of delta values from the first delta calculation module and calculates a plurality of changes to the second materialized view and a second delta calculation module that obtains the plurality of changes to the second materialized view from the delta adaptation module; and (2) computer programming that joins (applies) the change values to a second materialized view – i.e., a second delta processing module that applies the plurality of changes to the second materialized view from the second delta calculation module to the second materialized view. (FF 4 & 5.) We note that Appellants merely state that Gupta does not "disclose a second delta calculation module or a second processing delta module as recited by independent claim 6." This is insufficient to overcome the Examiner's findings that Gupta teaches these features.

Although ultimately unnecessary to the decision, we agree with the Examiner (Ans. 10, 15-17) that Gupta also teaches determining change values that represent modifications to the data in a first materialized view (i.e., a first delta calculation module), and joining (applying) the change values to the data in a first materialized view (i.e., a first delta processing module). (FF 4 & 5.)

Appellants did not file a Reply Brief, nor did Appellants provide any persuasive evidence supporting the assertions of alleged error in the

Examiner's position. Accordingly, Appellants have not met the burden to show error in the Examiner's findings.

For all the foregoing reasons, Appellants have not persuaded us of error in the Examiner's obviousness rejection of claims 2, 4, 6-10, 18, 19, 21, and 22. Accordingly, we affirm the Examiner's rejection of these claims.

CONCLUSION OF LAW

On the record before us, we find that Appellants have not established that the Examiner erred in finding the Sun reference discloses: (1) a module configured to access a refresh log and a first materialized view; (2) a module adapted refresh a first materialized view using a second plurality of data entries; (3) a module calculating a plurality of delta values from a plurality of changes in a refresh log and a second plurality of data values in a first materialized view; and (4) a module configured to apply a plurality of delta values to a second plurality of data entries in a first materialized view. We also find that Appellants have not established that the Examiner erred in finding the Sun and Gupta references collectively teach or would have suggested: (1) a first delta calculation module that calculates a plurality of delta values that represents the changes to the first materialized view; (2) a first delta processing module that applies the plurality of delta values to the first materialized view; and (3) a second delta calculation module or a second delta processing module.

DECISION

We affirm the Examiner's rejections of claims 1-22 under 35 U.S.C. §§ 102(b) and 103(a).

AFFIRMED

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